

CLAIMS

What is claimed is:

1. A complex multiplier for adjusting phase and/or gain imbalances in a signal comprising:
 - a first set of multiplication units to multiply an in-phase (“I”) component of said signal by a first set of coefficients; and
 - a second set of multiplication units to multiply a quadrature (“Q”) component of said signal by a second set of coefficients,wherein each of said coefficients in said first set and said second set are independently modifiable relative.
2. The complex multiplier as in claim 1 further comprising:
 - one or more adders for summing products of said coefficients and said I and Q components.
3. The complex multiplier as in claim 1 further comprising:
 - phase compensation logic to detect a phase imbalance in said signal and to modify one or more of said coefficients to correct said phase imbalance.
4. The complex multiplier as in claim 1 further comprising:
 - gain compensation logic to detect a gain imbalance in said signal and to modify one or more of said coefficients to correct said gain imbalance.
5. The complex multiplier as in claim 1 wherein said I and Q components are transmitted from an output of a fast-Fourier transform (“FFT”) module.

6. The complex multiplier as in claim 5 further comprising:
one or more adders for summing the products of said coefficients and said I and Q components.

7. The complex multiplier as in claim 6 wherein said products are transmitted to an inverse FFT module.

8. A method comprising:
independently adjusting amplitude and/or phase in a complex signal by providing one or more additional, independently-adjustable coefficients to multiply with said amplitude and/or phase values associated with said signal.

9. The method as in claim 8 wherein said complex signal is comprised of in-phase ("I") and quadrature ("Q") components.

10. The method as in claim 8 wherein said coefficients are frequency coefficients and said multiplication is performed after a fast-Fourier transform ("FFT") is performed on said signal.

11. The method as in claim 8 further comprising:
adding products of each of said multiplications to produce a sum of said products.

12. The method as in claim 11 further comprising:
performing an inverse FFT on said sum of said products.

13. A complex multiplier comprising:
means for independently adjusting phase and/or gain of a signal using a complex multiplier.

14. The complex multiplier as in claim 13 wherein said means for adjusting further comprises:
providing one or more additional, independently adjustable coefficients to multiply with I or Q components of said signal.

15. A machine-readable medium having code stored thereon which defines an integrated circuit (IC), said IC comprising:
a first set of multiplication units to multiply an in-phase ("I") component of said signal by a first set of coefficients; and
a second set of multiplication units to multiply a quadrature ("Q") component of said signal by a second set of coefficients,
wherein each of said coefficients in said first set and said second set are independently modifiable relative.

16. The machine-readable medium as in claim 15 further comprising:
one or more adders for summing products of said coefficients and said I and Q components.

17. The machine-readable medium as in claim 15 wherein said IC further comprises:
phase compensation logic to detect a phase imbalance in said signal and to modify one or more of said coefficients to correct said phase imbalance.

23. The method as in claim 22 wherein said complex signal is comprised of in-phase ("I") and quadrature ("Q") components.

24. The method as in claim 22 wherein, to decimate said complex signal, only M out of N frequency components are multiplied by said coefficients, wherein $M < N$.

25. The method as in claim 22 further comprising:
detecting a phase imbalance in said complex signal and modifying one or more of said frequency coefficients to correct said phase imbalance.

26. The method as in claim 22 further comprising:
detecting a gain imbalance in said signal and modifying one or more of said frequency coefficients to correct said gain imbalance.

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